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| EXAMINER | |
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| ENTEZARI, MICHELLE M | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| **Office Action Summary** | **Application No.** 10/569,318 | **Applicant(s)** GOMILA ET AL. |
|---|---|---|
| | **Examiner** MICHELLE ENTEZARI | **Art Unit** 2624 |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/10/08, 3/13/08, 5/18/07, 2/22/06*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 6, 7, 10, and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The manner in which the intersection points are used to determine the cut frequencies is not described in sufficient detail.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1, 3, and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Frank (US 7362911 B1) in view of May (6067125).

**Regarding claim 1,** Frank discloses a method for automatically modeling patterns (*stationary noise pattern removal method, col. 5, lines 10-15; method is completely adaptive and does not require calibration, method automatically adapts, col. 7 lines 40-45*) comprising the steps of: transforming a set of film grain samples to the frequency domain (*the DCT transforms the image content for a pixel block from the spatial to the frequency domain with the same number of coefficients, col. 5, lines 40-45); storing each set of coefficients resulting from such transform (matrix of coefficients, col. 5, lines 45-55*); the coefficients forming a pattern (*The detector will determine if there is a regular pattern indicated by a small number of larger coefficients, col. 5, lines 35-40*); analyzing the pattern created by the transform coefficients (*The detector will determine if there is a regular pattern indicated by a small number of larger coefficients, col. 5, lines 35-40)*; and estimating the cut frequencies of a 2D band-pass filter that can effectively simulate the pattern of transform coefficients by filtering random noise in a frequency domain (*high frequency texture detector based on a two dimensional image transform (or a discrete transform), for example a DCT or FFT (Discrete Cosine Transform/Fast Fourier Transform), can be used to calculate the predicted pixel values, assuming that fine-grain texture is represented by the plurality of high frequency coefficients, applying a 2-D low-pass filter with a "cut-off" frequency close to the upper*

*coefficients, such as the upper two coefficients, would leave the texture of the pixel block pretty much intact but filter out the noise components which fluctuate from pixel to pixel, col. 5, lines 30-60*).

Frank does not disclose modeling film grain patterns or transforming a set of film grain samples specifically.

May teaches modeling film grain patterns (*linear model of noise, col. 3, lines 35-45, high film grain noise removal performance, col. 4, lines 5-10*) involving transforming a set of film grain samples (*temporal and spatial filters, col. 2, lines 35-45, Wiener filter, col. 2, lines 55-60*).

It would have been obvious at the time of the invention to one skilled in the art to combine the invention of Frank with the film grain model taught by May, because the invention of May causes effective noise reduction since film grain noise is less correlated temporally than spatially and temporal artifacts and spatial blurring are substantially avoided (*May, col. 3, lines 5-15*), and because film grain noise is a common source of noise in video data (*May, col. 1, lines 50-60*).

**Regarding claim 3,** Frank and May disclose the method according to claim 1. Frank further discloses the film grain samples are processed in blocks of NxN pixels *(8 x 8 pixel block, col. 5, lines 40-45*).

**Regarding claim 12,** Frank discloses a method for automatically modeling patterns (*stationary noise pattern removal method, col. 5, lines 10-15; method is completely adaptive and does not require calibration, method automatically adapts, col. 7 lines 40-45*) comprising the steps of: transforming a set of film grain samples to the frequency domain (*the DCT transforms the image content for a pixel block from the spatial to the frequency domain with the same number of coefficients, col. 5, lines 40-45); storing each set of coefficients resulting from such transform (matrix of coefficients, col. 5, lines 45-55*); the coefficients forming a pattern (*The detector will determine if there is a regular pattern indicated by a small number of larger coefficients, col. 5, lines 35-40*); analyzing the pattern created by the transform coefficients (*The detector will determine if there is a regular pattern indicated by a small number of larger coefficients, col. 5, lines 35-40)*; and estimating the cut frequencies of a 2D band-pass filter that can effectively simulate the pattern of transform coefficients by filtering random noise in a frequency domain (*high frequency texture detector based on a two dimensional image transform (or a discrete transform), for example a DCT or FFT (Discrete Cosine Transform/Fast Fourier Transform), can be used to calculate the predicted pixel values, assuming that fine-grain texture is represented by the plurality of high frequency coefficients, applying a 2-D low-pass filter with a "cut-off" frequency close to the upper coefficients, such as the upper two coefficients, would leave the texture of the pixel block pretty much intact but filter out the noise components which fluctuate from pixel to pixel, col. 5, lines 30-60*).

Frank does not disclose modeling film grain patterns or transforming a set of film grain samples specifically.

May teaches receiving a set of film grain samples (*video input sample received into system, col. 3, lines 55-65*), modeling film grain patterns (*linear model of noise, col. 3, lines 35-45, high film grain noise removal performance, col. 4, lines 5-10*) involving transforming a set of film grain samples (*temporal and spatial filters, col. 2, lines 35-45, Wiener filter, col. 2, lines 55-60*).

It would have been obvious at the time of the invention to one skilled in the art to combine the invention of Frank with the film grain model taught by May, because the invention of May causes effective noise reduction since film grain noise is less correlated temporally than spatially and temporal artifacts and spatial blurring are substantially avoided (*May, col. 3, lines 5-15*), and because film grain noise is a common source of noise in video data (*May, col. 1, lines 50-60*).

5. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Frank (US 7362911 B1) and May (6067125) as applied to claim 1, further in view of Lu et al. (US 20070002947 A1).

Frank and May disclose the method according to claim 1.

Frank and May do not disclose transmitting at least one cut frequency in a Supplemental Enhancement Information message.

Lu et al. teach transmitting at least one cut frequency in a Supplemental Enhancement Information message (*Block noise and film grains reduced, [0125], Filter information can be set in SEI (supplemental enhancement information) [0132]*).

It would have been obvious at the time of the invention to one skilled in the art to combine the SEI message taught by Lu et al. with the method of Frank and May, because SEI is considered as additional information in MPEG-4 AVC standard (*Lu et al., [0132]*), and Frank discloses the method is useful for video (*Frank, col. 10, lines 55-60*).

6. **Claims 4 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Frank (US 7362911 B1) and May (6067125) as applied to claim 3, further in view of Engeldrum et al. (US 2002/0003903 A1) further in view of Ohnishi et al. (US 6327391 B1).

Regarding claims 4 and 8 Frank and May disclose the method according to claim 3.

**Regarding claim 4,** Frank and May do not disclose the step of analyzing the pattern created by the transform coefficients further comprises the steps of: computing a mean block of NxN transform coefficients by averaging the transform coefficients from all the stored blocks; defining horizontal and vertical mean vectors of N components each by averaging the mean block of NxN coefficients along rows and columns, respectively, of each transformed block; representing the horizontal and vertical mean vectors as separate curves; and establishing cut frequencies from mean vectors.

Engeldrum et al. teach computing a mean block of NxN transform coefficients by averaging the transform coefficients from all the stored blocks (*cosine transform is used to process 8x8 blocks, mean coefficient value found for each block, [0205]*); defining horizontal and vertical mean vectors of N components each by averaging the mean block of NxN coefficients along rows and columns, respectively, of each transformed block (*mean vector vm, [0161]*); representing the horizontal and vertical mean vectors as separate curves (*collection of I/O curves, [0160]; I/O curve can be written as the linear combination of the average vector and three basis vectors, [0162]*);

It would have been obvious at the time of the invention to combine the methods of Engelrum et al. with the method of Frank and May, because this leads to a significant compaction of data needed to describe the I/O curves (*Engeldrum et al., [0163]).*

Frank and May and Engeldrum et al. do not disclose establishing cut frequencies from mean vectors.

Ohnishi et al. teach establishing cut frequencies from mean vectors (*cutoff frequency changed in accordance with motion vector, col. 20, lines 5-15, the motion vector is the mean value, col. 6, lines 55-60, vectors stored in horizontal and vertical directions, col. 9, lines 60-65*).

It would have been obvious at the time of the invention to one skilled in the art to combine the mean vectors taught by Ohnishi et al. with the method of Frank and May and Engeldrum et al. because with the adaptable cutoff frequency, the block discontinuities are less prominent (*Ohnishi et al., col. 20, lines 30-50*).

**Regarding claim 8,** Frank and May do not disclose computing a mean block of NxN transform coefficients by averaging the transform coefficients from all the stored blocks; defining horizontal and vertical mean vectors of N components each by averaging the mean block of NxN transform coefficients along rows and columns, respectively, of each transformed block; averaging the horizontal and vertical mean vectors into a single mean vector; representing the mean vectors as a curve; and establishing cut frequencies from mean vectors.

Engeldrum et al. disclose computing a mean block of NxN transform coefficients by averaging the transform coefficients from all the stored blocks (*cosine transform is used to process 8x8 blocks, mean coefficient value found for each block, [0205]*); defining horizontal and vertical mean vectors of N components each by averaging the mean block of NxN transform coefficients along rows and columns, respectively, of each transformed block (*mean vector vm, [0161]*); averaging the horizontal and vertical mean vectors into a single mean vector (*mean vector vm, [0161]*); and representing the mean vectors as a curve (*I/O curve can be written as the linear combination of the average vector and three basis vectors, [0162]*).

It would have been obvious at the time of the invention to combine the methods of Engelrum et al. with the method of Frank and May, because this leads to a significant compaction of data needed to describe the I/O curves (*Engeldrum et al., [0163]).*

Frank and May and Engeldrum et al. do not disclose establishing cut frequencies from mean vectors.

Ohnishi et al. disclose establishing cut frequencies from mean vectors (*cutoff frequency changed in accordance with motion vector, col. 20, lines 5-15, the motion vector is the mean value, col. 6, lines 55-60, vectors stored in horizontal and vertical directions, col. 9, lines 60-65*).

It would have been obvious at the time of the invention to one skilled in the art to combine the mean vectors taught by Ohnishi et al. with the method of Frank and May and Engeldrum et al. because with the adaptable cutoff frequency, the block discontinuities are less prominent (*Ohnishi et al., col. 20, lines 30-50*).

7. **Claims 5 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Frank (US 7362911 B1) and May (6067125) and Engeldrum et al. (US 2002/0003903 A1) and Ohnishi et al. (US 6327391 B1) as applied to claims 4 and 8 above, further in view of Ratakonda et al. (US 6285711 B1 ).

Frank and May and Engeldrum et al. and Ohnishi et al. disclose the method according to claims 4 and 8.

Frank and May and Engeldrum et al. and Ohnishi et al. do not disclose further comprising the step of low pass filtering at least one mean vector.

Ratakonda et al. teach the step of low pass filtering at least one mean vector (*interpolate the column and row average vectors, can use a low-pass filter to interpolate, col. 8, lines 1-10*).

It would have been obvious at the time of the invention to one skilled in the art to combine the low pass filtering taught by Ratakonda et al. with the method of Frank and

May and Engeldrum et al. and Ohnishi et al., because the method of Ratakonda et al. improves the accuracy of motion estimation (*Ratakonda et al., col. 2, lines 60-65*).

## ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. 6496221 (esp. col 6, lines 5-10)

b. 5526446

c. 20030068097 (esp. paragraphs [0144]-[0153])

d. 20020206103 (esp. paragraphs [0051]-[0058])

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE ENTEZARI whose telephone number is (571)270-5084. The examiner can normally be reached on M-Th, 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michelle Entezari/
Examiner, Art Unit 2624

/Brian Q Le/
Examiner, Art Unit 2624